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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/806,319 | 03/23/2004 | Yong-jin Ahn | 1293.1278C5 | 1755 |
| 49455 7590 04/19/2007 STEIN, MCEWEN & BUI, LLP 1400 EYE STREET, NW SUITE 300 WASHINGTON, DC 20005 | | | EXAMINER CHOW, LIXI | |
| | | | ART UNIT 2627 | PAPER NUMBER |
| SHORTENED STATUTORY PERIOD OF RESPONSE | | | MAIL DATE | |
| 3 MONTHS | | | 04/19/2007 | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | | |
|------------------------------|------------------------|--|---------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 10/806,319 | | AHN ET AL. | |
| | Examiner | | Art Unit | |
| | Lixi Chow | | 2627 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 7-12, 14 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16, 17, 19 and 20 is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-12, 14 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 12 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Ichihara (US 6,396,792):

Regarding claim 12:

Ichihara discloses a method of forming a first state and a second state alternatively and sequentially on an information storage medium in response to input data having a first level and a second level (see fig. 1A), respectively, in a recording apparatus, the method comprising:

generating a recording waveform which comprises a recording pattern corresponding to the first level of the input data and having a recording pattern multi-pulse, an erase pattern preceding the recording pattern and having an erase pattern multi-pulse corresponding to the second level of the input data (see Figs. 1A, 1B and 1D), and a cooling pulse concatenating the erase pattern with a preceding other recording pattern (a cooling pulse is the pulse between the erase pattern and the recording pattern), wherein:

the erase pattern multi-pulse alternates between a low multi-pulse level and a high multi-pulse level, and a leading pulse of the erase pattern multi-pulse is set to the high multi-pulse level (see Fig. 1B, leading pulse of the erase pattern is at power Pc1) and a power level between an

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end pulse of the erase pattern multi-pulse and a first pulse of the recording pattern multi-pulse is set to the high multi-pulse level (see col. 6, line 62 to col. 7, line 1; the example provided by Ichihara, i.e., the level may be changed from Pc1 to Pa, suggests that the power level of a period between an end point of the erase pattern and a start point of the leading pulse of a recording pattern is at high power level).

Regarding claim 14:

Claim 14 recite similar limitations as in claim 12; hence, claim 14 is rejected under the same reasons set forth in claim 12.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3 and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (US 5,150,351; hereafter Ohno) in view of Ichihara (US 6,396,792).

Regarding claim 1:

Ohno discloses a method of forming a first state and a second state alternatively and sequentially on an optical recording medium in response to input data having a first level and a second level in an optical recording apparatus (see Fig. 4(a)), the method comprising:

generating a recording waveform which includes a first multi-pulse corresponding to the first level of the input data and having a plurality of first pulses alternating between a low first multi-pulse power level and a high first multi-pulse power level, a second multi-pulse preceding

the first multi-pulse which corresponds to the second level of the input data and has a plurality of second pulses alternating between a low second multi-pulse power level and a high second multi-pulse power level, (see Fig. 4(b)) wherein:

the high second multi-pulse power level is between the low and high first multi-pulse power levels, and a leading one of the second pulses is set to the low second multi-pulse power level (see Fig. 4(b); the high second multi-pulse power level is P_b , the low and high first multi-pulse power levels are P_r and P_p , respectively).

Ohno fails to disclose the power level between an end of the second multi-pulse and a first one of the pulses of the first multi-pulse is set to the high second multi-pulse power level. However, Ichihara discloses a method of forming a first state and a second state alternatively and sequentially on an optical recording medium in response to input data, comprising:

generating an erase pattern and a recording pattern, wherein the erase pattern includes a leading pulse and a multi-pulse having corresponding high second and low second power levels, and a power level of a period between an end point of the erase pattern and a start point of a leading pulse of the recording pattern is a high second power level of the multi-pulse (see Fig. 1B and col. 6, line 62 to col. 7, line 1; the example provided by Ichihara, i.e., the level may be changed from P_{c1} to P_a , suggests that the power level of a period between an end point of the erase pattern and a start point of the recording pattern is the high second power level of the multi-pulse).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the method of Ohno, so that the power level of a period between an end of the erase pattern and the start of the recording pattern is the high second power level of the

multi-pulse as suggested by Ichihara. One of ordinary skill in the art would have been motivated to do this because having a high second power level of the multi-pulse between the end of the erase pattern and the start of the recording pattern will ensure the entire area in the width direction of the recording track uniformly passes the temperature zone promoting generation of crystal nuclei (see col. 7, lines 1-5).

Regarding claim 2:

Ohno discloses the method of claim 1, further comprising:

forming the first state on the optical recording medium according to the first pulses of the first multi-pulse; and forming the second state on the optical recording medium according to the second pulses of the second multi-pulse (see Figs. 4(a) and 4(b)).

Regarding claim 3:

Ohno discloses the method of claim 1, further comprising:

forming a mark as the first state on the optical recording medium according to the first multi-pulse; and forming a the space as the second state on the optical recording medium according to the second multi-pulse (mark is formed when the recording waveform of Fig. 4(a) is at a high state, and space is formed when the recording waveform of Fig. 4(a) is at a low state).

Regarding claims 7-10:

Ohno discloses the method of claim 1, further comprising: generating information data representing a characteristic of one of the first multi-pulse and the second multi-pulse (see Fig. 6, the MP circuit 8 generates information representing a characteristic of one of the first multi-pulse and the second multi-pulse); and rotating the optical recording medium in response to the information data (see Fig. 6, element 6); and rotating the optical recording medium at a speed

corresponding to the information data (see Fig. 6, element 6); and recording the information data on the optical recording medium (see Fig. 6).

Regarding claim 11:

Ohno discloses a method of forming a first state and a second state alternatively and sequentially on an information storage medium in response to input data having a first level and a second level (see Fig. 4(a)), respectively, in a recording apparatus, the method, comprising:

generating a recording waveform which comprises a recording pattern having a recording pattern multi-pulse corresponding to the first level of the input data, an erase pattern preceding the recording pattern and having an erase pattern multi-pulse corresponding to the second level of the input data (see Fig. 4(b)), and a cooling pulse concatenating the erase pattern with a preceding other recording pattern (cooling pulse is the pulse between erase pattern and a recording pattern), wherein:

the erase pattern multi-pulse alternates between a low multi-pulse level and a high multi-pulse level (see Fig. 4(b); a low multi-pulse level is at P_r , and a high multi-pulse level is at P_b), and a leading pulse of the erase pattern multi-pulse is set to the low multi-pulse level (see Fig. 4(b)).

Ohno fails to disclose the power level between an end of the erase pattern multi-pulse and a first pulse of the recording pattern multi-pulse is set to the high multi-pulse level. However, Ichihara discloses a method of forming a first state and a second state alternatively and sequentially on an optical recording medium in response to input data, comprising:

generating an erase pattern and a recording pattern, wherein the erase pattern includes a leading pulse and a multi-pulse having corresponding high and low power levels, and a power

level of a period between an end point of the erase pattern and a start point of a leading pulse of the recording pattern is a high power level of the multi-pulse (see Fig. 1B and col. 6, line 62 to col. 7, line 1; the example provided by Ichihara, i.e., the level may be changed from P_{c1} to P_a , suggests that the power level of a period between an end point of the erase pattern and a start point of the recording pattern is the high power level of the multi-pulse).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the method of Ohno, so that the power level of a period between an end of the erase pattern and the start of the recording pattern is the high power level of the multi-pulse as suggested by Ichihara. One of ordinary skill in the art would have been motivated to do this because having a high power level of the multi-pulse between the end of the erase pattern and the start of the recording pattern will ensure the entire area in the width direction of the recording track uniformly passes the temperature zone promoting generation of crystal nuclei (see col. 7, lines 1-5).

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno in view of Ichihara as applied to claim 1 above, and further in view of Miyamoto et al. (US Pub. No. 2003/0053403; hereafter Miyamoto).

Regarding claim 18:

The combination of Ohno and Ichihara do not disclose a light having a wavelength of substantially 405 nm. However, Miyamoto discloses a method of recording input data onto optical recording medium, the method comprising recording a first state and the second state according to a generated recording waveform using a light having a wavelength of substantially 405 nm (see paragraph [0091]).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to record the first state and the second state taught by Ohno using a light having a wavelength of 405 nm as suggested by Miyamoto. One of ordinary skill in the art would have been motivated to do this, because the method of recording information on optical disc using wavelength 405 nm can greatly increase the amount of data to be recorded; hence a high density recording medium can be realized.

Allowable Subject Matter

6. Claims 16, 17, 19 and 20 are allowed.

None of the reference of record alone or in combination disclose a method of forming a first state and a second state alternatively and sequentially on an optical recording medium in response to input data having a first level and a second level in an optical recording apparatus, the method comprising:

generating a recording waveform which includes a first multi-pulse having a plurality of first pulses corresponding to the first level of the input data and a second multi-pulse having a plurality of second pulses corresponding to the second level of the input data, wherein

one of the first and second states corresponds to a space formed using an erase pattern including the corresponding one of the first and second multi-pulses having a high erase power and a low erase power for corresponding pulses,

the other one of the first and second states corresponds to a mark formed using a recording pulse including the corresponding other one of the first and second multi-pulses having a high write power and a low write power for corresponding pulses,

the low erase power is greater than the low write power, and the generating of the recording waveform comprises causing a power level of a leading pulse of the erase pattern to be the same erase power as a power level of a trailing pulse of the erase pattern; and/or the generating of the recording waveform comprises causing a power level of a leading pulse of the erase pattern to be the tow erase power.

Response to Arguments

7. Applicant's arguments with respect to claims 1-3, 7-12 and 14 have been considered but are moot in view of the new ground(s) of rejection.

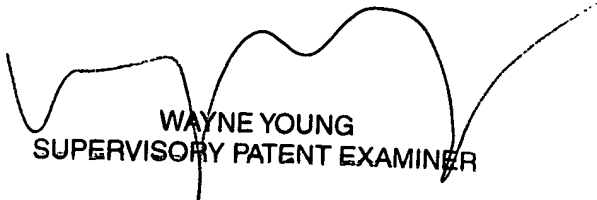
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lixi Chow whose telephone number is 571-272-7571. The examiner can normally be reached on Mon-Fri, 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LC 4/16/07


WAYNE YOUNG
SUPERVISORY PATENT EXAMINER